

TEMPERATURE, NITROGEN DIOXIDE, CIRCULATING RESPIRATORY VIRUSES AND ACUTE UPPER RESPIRATORY INFECTIONS AMONG CHILDREN IN TAIPEI, TAIWAN: A POPULATION-BASED STUDY

Yu-Chun Wang, *Department of Bioenvironmental Engineering, College of Engineering Chung Yuan Christian University, Taiwan*
Yu-Kai Lin, *Institute of Environmental Health, College of Public Health National Taiwan University, Taiwan; Environmental and Occupational Medicine and Epidemiology Program, Department of Environmental Health, Harvard School of Public Health, USA*
Chin-Kuo Chang, *Department of Health Service and Population Research, King's College London, UK*

Background and Aims: This study investigated whether outpatient visits of acute upper respiratory infections (AURIs) for children aged less than 15 years are associated with temperature, air pollutants and circulating respiratory viruses in Taipei, Taiwan.

Methods: Outpatient visits records for AURIs (ICD9 CM codes: 460, 462, 463, 464, 465.9 and 487) from a randomly selected sample ($n = 39,766$ children in 2005) was used to estimate the cumulative relative risks (RR) associated with per-standard deviation (SD) increases of virus-specific positive isolation rate lasting for 8 days (lag0-lag7 days), air pollutants (NO_2 , O_3 and $\text{PM}_{2.5}$) lasting for 5 days (lag0-lag4 days), and average temperature lasting for 8 days (lag0-lag7 days) by distributed lag models, 2003-2007.

Results: After controlling for day of week, holiday effects and long term time, per-SD increase of virus specific isolation rate for influenza type A (SD = 13.2%), type B (SD = 8.76%), and adenoviruses (SD = 5.25%) revealed statistical significance for overall 8-day RRs of 1.03 [95% confidence interval (CI): 1.02, 1.03], 1.10 (95% CI: 1.09, 1.10) and 1.06 (95% CI: 1.04, 1.07), respectively, in cold seasons. Overall 5-day RR = 1.05 (95% CI: 1.03, 1.06) for per SD (SD = 7.78 ppb) increase of NO_2 in warm seasons (May-October) and 1.13 (95% CI: 1.12, 1.15) in cold seasons (November- April) were found. The most elevated risk of average temperature per SD (SD = 5.34°C) decrease was identified with an inverse association to AURIs of an RR = 1.17 (95% CI: 1.15, 1.19) in cold seasons.

Conclusions: Current study suggested a positive association between outpatient visits of AURIs and ambient environment factors, including average temperature, air pollutants, and circulating respiratory viruses.